Local Government Air Quality Toolkit

Auto repair shops visual guide

Visual examples to help council officers when investigating air emissions complaints about auto repair shops

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

The Local Government Air Quality Toolkit has been developed by Department of Climate Change, Energy, the Environment and Water in collaboration with the NSW Environment Protection Authority, the NSW Department of Planning, Housing and Infrastructure, Local Government NSW and local councils.

Cover photo: Stack on an auto repair shop.
Zephyr Environmental

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

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Environment Protection Authority and
Department of Climate Change,
Energy, the Environment and Water
Locked Bag 5022, Parramatta NSW 2124
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (Environment and Heritage enquiries)
TTY users: phone 133 677, then ask for 1300 361 967
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967
Email info@environment.nsw.gov.au
Website www.environment.nsw.gov.au

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Introduction

This visual guide provides information and visual examples to assist council officers when investigating complaints from local residents about dust and odour impacts from auto repair shops.

Refer to the Local Government Air Quality Toolkit – *Auto repair shops guidance note* for further information about good design and management practices to reduce air emissions from auto repair shops.

The images in this visual guide are labelled with traffic light symbols indicating the effectiveness or otherwise of management of odour and particulate issues (Figure 1).

Figure 1 Key to traffic light symbols

Chapter 3 of the Local Government Air Quality Toolkit – *Resource pack* includes a checklist for conducting a site inspection for odour generating activities from spray painting and surface coating activities, as well as investigation of odour complaints.

Smash repair or auto-refinishing operations involve:

- vehicle preparation
- vehicle priming
- topcoat application
- equipment clean-up.

Stack design and height

Air impurities emitted from auto repair shops should be discharged from a point source (e.g. a stack or vent) to help with dispersion of solvent-based odours. A stack height of at least 3 m above the highest point of the roof line is considered best practice.

Figure 2 shows a stack that is above the roof line of all nearby buildings, allowing for adequate dispersion of solvent emissions.

Stacks should be high enough so that dispersion is not impeded by downwash from buildings or by other tall objects such as trees.

Figure 2 **Well designed stack above the roof line of nearby buildings**
Source: Damon Roddis/Zephyr Environmental

Figure 3 shows the same stack from the rear, illustrating that when outlet stacks are designed appropriately, auto repair shops can coexist with residential land uses without conflict.

Figure 3 **Stack visible above the roof line of nearby residential buildings**
Source: Damon Roddis/Zephyr Environmental

Figure 4 shows another appropriately designed spray booth stack, defined by the following features:

- suitable height to avoid downwash from buildings or other tall objects such as trees
- vertical discharge from the stack not impeded by a rain cap
- discharge velocity should be 10–15 m/s.

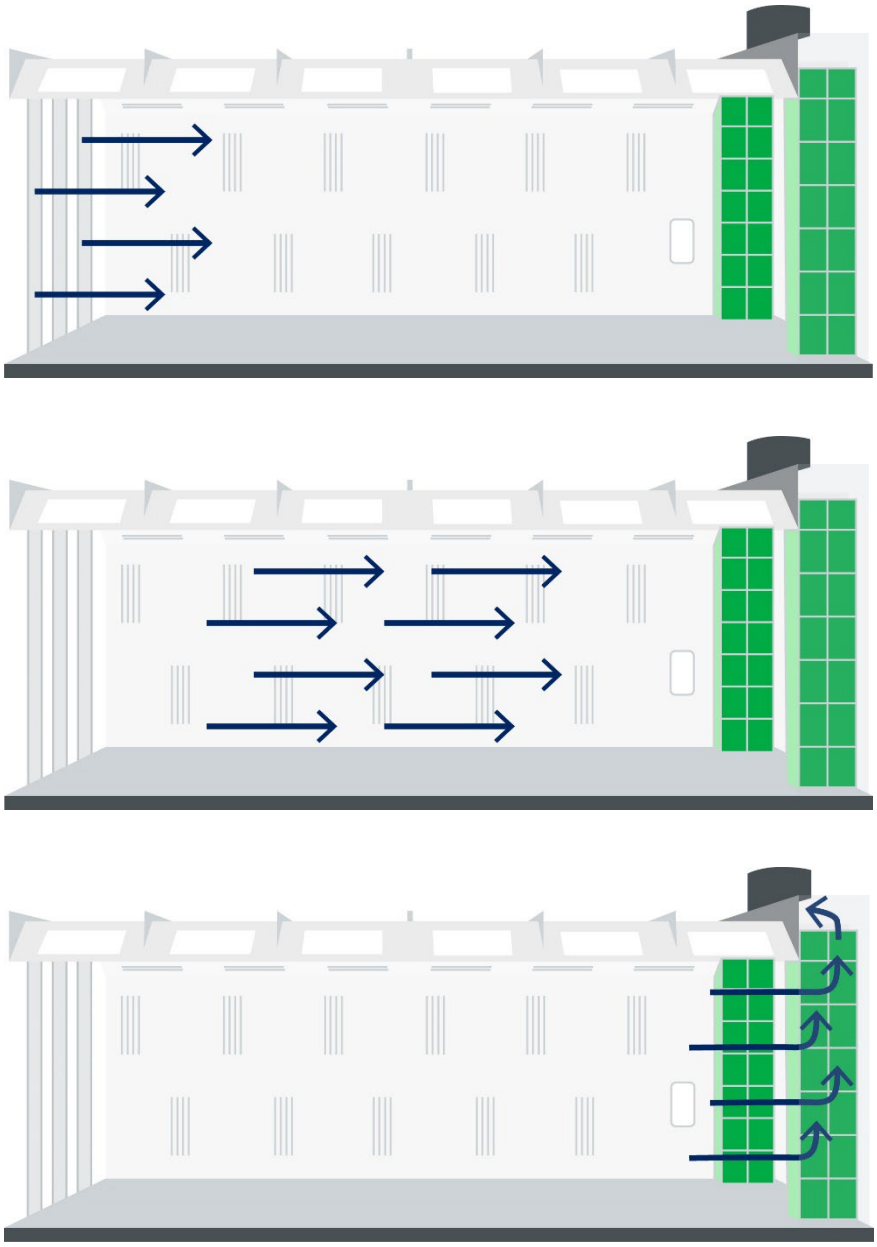
Figure 4 **Well designed spray booth stack**
Source: Damon Roddis/Zephyr Environmental

Spray booth design

Paint spraying must be conducted so that air pollutants emitted are controlled for both operators and neighbours. This is accomplished with spray booths and extraction ventilation and dispersion systems.

Figure 5 and Figure 6 show the stages in the 2 main types of spray booths operated by auto repair shops, cross-flow and downdraft, respectively.

Cross-flow system



Stage 1

Air enters through the front of the booth and then through the intake filters.

As the air passes through the filters, contaminants are captured.

Stage 2

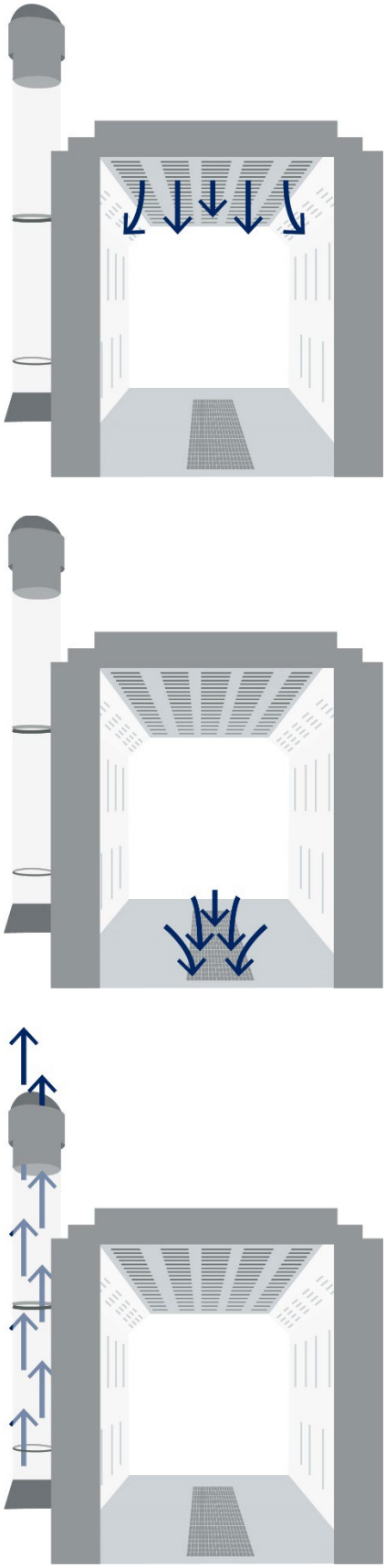
Horizontal airflow intake causes air to flow uniformly over painted parts and through a rear exhaust chamber.

Stage 3

The clean, filtered air now continues through the exhaust cavity.

Figure 5 **Stages in a cross-flow system**

Downdraft system



Stage 1

Airflow is introduced into the booth's air supply plenum and drawn through the supply filters located in the ceiling, which act as a diffusion medium.

Stage 2

The clean air continues down and around the object being sprayed, collecting overspray along the way.

This overspray is then pulled downwards through exhaust filters located in a grated pit at floor level.

Stage 3

The filtered air passes through an exhaust fan and out of the system.

Figure 6 **Stages in a downdraft system**

Spray booth operation

All paint spraying operations in auto repair shops should be carried out in a totally enclosed booth under negative pressure, to prevent fugitive emissions of odour and particulate matter.

Australian Standard AS 4114:2020 provides detail on spray booth and paint mixing room design and construction, including best practice for extraction systems.

The council officer should check there are no gaps around the filter medium being used, and that spray booth doors close tightly during operation. As a guide, an adequate draft through any openings in the booth is around 0.5 m/s across any open face in the booth.

Replacing intake and exhaust filters regularly is one of the simplest actions to ensure the cleanliness and efficiency of a paint booth. Clogged or overloaded filters hinder proper airflow through the paint booth. Filter replacement will be site and application-specific and this should be governed by the manometer measurements, discussed below.

Differential pressure gauges are fitted to the exterior of the spray booth and are used to measure exhaust filter loading.

A manometer is the most often used ‘dirty filter indicator’ in auto spray booths. It indicates when paint filters are loaded and need replacement. Manometers are also known as draft gauges or magnehelic gauges. The manometer in Figure 7 displays a pressure drop across the booth and filter that indicates filters do not need changing (depending on the booth manufacturer, this may be less than 60 pascals).

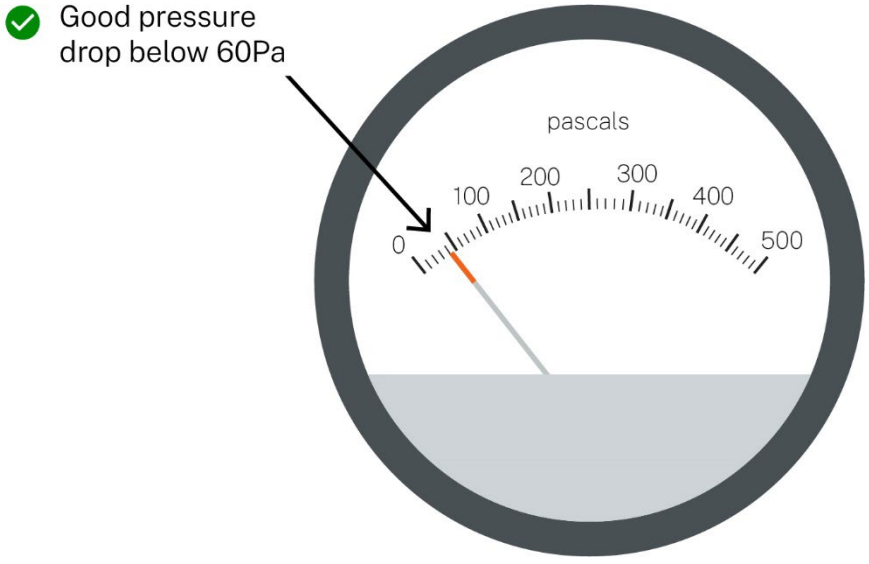


Figure 7 **Manometer reading indicating filters do not need to be replaced**

Spray gun use and clean-up

Clean-up of spray guns and equipment should be completed in a controlled space with appropriate vapour capture.

A dedicated spray gun cleaner will contain and vent any solvent emissions as a controlled emission (i.e. captured and vented outside the building via a stack), reducing the likelihood of off-site odour complaints (Figure 8).

Figure 8 **Dedicated spray gun cleaner**

Spent solvent management

Spent solvents should be held in closed systems for disposal and not exposed for evaporation. Operators are responsible for ensuring spent solvents are disposed of by licensed waste contractors. For more information about tracking and transporting hazardous waste, see the NSW Environment Protection Authority's *Tracking and transporting hazardous waste* website.

A solvent recycling machine can extend the life of solvents prior to disposal and reduce odorous solvent emissions (Figure 9).

Figure 9 **Solvent recycling machine**

More information

- Tracking and transporting hazardous waste